

1 **CLAIMS**

2 1. A method of encoding a source image, the method comprising:
3 generating a base layer representing a low-resolution portion of the source
4 image, wherein the base layer has an associated aspect ratio; and
5 generating an enhancement layer representing a high-resolution portion of
6 the source image, wherein the enhancement layer has an associated aspect ratio,
7 and wherein the aspect ratio associated with the enhancement layer differs from
8 the aspect ratio associated with the base layer.

9
10 2. A method as recited in claim 1 wherein the aspect ratio associated
11 with the base layer corresponds to an aspect ratio associated with low-resolution
12 televisions.

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14 3. A method as recited in claim 1 wherein the aspect ratio associated
15 with the enhancement layer corresponds to an aspect ratio associated with high-
16 resolution televisions.

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18 4. A method as recited in claim 1 wherein the aspect ratio associated
19 with the base layer is 4:3.

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21 5. A method as recited in claim 1 wherein the aspect ratio associated
22 with the enhancement layer is 16:9.
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1 6. A method as recited in claim 1 wherein the step of generating a base
2 layer includes low-pass filtering the source image.

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4 7. A method as recited in claim 1 wherein the step of generating an
5 enhancement layer includes subtracting a portion of the base layer from a
6 corresponding portion of the source image.

7
8 8. A method as recited in claim 1 wherein the step of generating an
9 enhancement layer includes:

10 extracting a first image from the base layer, wherein the aspect ratio of the
11 first image differs from the aspect ratio of the base layer;

12 extracting a second image from the source image, wherein the aspect ratio
13 of the second image matches the aspect ratio of the first image; and

14 subtracting the first image from the second image.

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16 9. A method as recited in claim 8 wherein the aspect ratio of the first
17 image matches an aspect ratio associated with high-resolution televisions.

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19 10. A method as recited in claim 8 further including determining a
20 vertical offset value, wherein the vertical offset value indicates the location from
21 which the first image is extracted from the base layer.

1 **11.** A method as recited in claim 8 further including determining a
2 horizontal offset value, wherein the horizontal offset value indicates the location
3 from which the first image is extracted from the base layer.

4
5 **12.** A method as recited in claim 1 wherein the step of generating an
6 enhancement layer includes high-pass filtering the source image.

7
8 **13.** A method as recited in claim 1 further including combining the base
9 layer and the enhancement layer into a single transport stream.

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11 **14.** A method as recited in claim 1 further including transmitting the
12 base layer and the enhancement layer to an image decoding system.

13
14 **15.** A method as recited in claim 1 further including transmitting only
15 the base layer to an image decoding system.

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17 **16.** A method as recited in claim 1 further including transmitting the
18 base layer to an image decoding system using a first transmission medium and
19 transmitting the enhancement layer to the image decoding system using a second
20 transmission medium.

1 **17.** A method as recited in claim 1 further including transmitting the
2 base layer to an image decoding system using a first transmission format and
3 transmitting the enhancement layer to the image decoding system using a second
4 transmission format.

5
6 **18.** A method as recited in claim 1 further including storing the base
7 layer and the enhancement layer on a storage medium.

8
9 **19.** A method as recited in claim 1 further including storing the base
10 layer on a first storage medium and storing the enhancement layer on a second
11 storage medium.

12
13 **20.** One or more computer-readable memories containing a computer
14 program that is executable by a processor to perform the method recited in claim
15 1.

16
17 **21.** A method comprising:
18 decoding a first layer representing a low-resolution portion of an encoded
19 image, wherein the first layer has an associated aspect ratio; and
20 decoding a second layer representing a high-resolution portion of the
21 encoded image, wherein the second layer has an associated aspect ratio, and
22 wherein the aspect ratio associated with the second layer differs from the aspect
23 ratio associated with the first layer.
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1 **22.** A method as recited in claim 21 wherein the aspect ratio associated
2 with the first layer corresponds to an aspect ratio associated with low-resolution
3 televisions.

4
5 **23.** A method as recited in claim 21 wherein the aspect ratio associated
6 with the second layer corresponds to an aspect ratio associated with high-
7 resolution televisions.

8
9 **24.** A method as recited in claim 21 wherein the aspect ratio associated
10 with the first layer is 4:3.

11
12 **25.** A method as recited in claim 21 wherein the aspect ratio associated
13 with the second layer is 16:9.

14
15 **26.** A method as recited in claim 21 wherein the first layer is a base
16 layer.

17
18 **27.** A method as recited in claim 21 wherein the second layer is an
19 enhancement layer.

20
21 **28.** A method as recited in claim 21 further including communicating
22 the first layer to a low-resolution television.

1 **29.** A method as recited in claim 21 further including combining the
2 second layer and a portion of the first layer to generate high-resolution image data.

3
4 **30.** A method as recited in claim 21 wherein the method is executed by
5 a television.

6
7 **31.** A method as recited in claim 21 wherein the first layer is decoded
8 from a physical medium and the second layer is decoded from a received data
9 stream.

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11 **32.** A method as recited in claim 21 further including correcting an
12 anamorphic squeeze in the first layer.

13
14 **33.** A method as recited in claim 21 wherein the first layer is received at
15 a first time and the second layer is received at a second time.

16
17 **34.** A method as recited in claim 21 wherein the first layer is received
18 from a first media and the second layer is received from a second media.

19
20 **35.** One or more computer-readable memories containing a computer
21 program that is executable by a processor to perform the method recited in claim
22 21.

1 **36.** A method comprising:
2 transmitting a base layer representing a low-resolution portion of an image,
3 wherein the base layer has an associated aspect ratio; and
4 transmitting an enhancement layer representing a high-resolution portion of
5 the image, wherein the enhancement layer has an associated aspect ratio, and
6 wherein the aspect ratio associated with the enhancement layer differs from the
7 aspect ratio associated with the base layer.

8
9 **37.** A method as recited in claim 36 wherein the aspect ratio associated
10 with the base layer corresponds to an aspect ratio associated with low-resolution
11 televisions.

12
13 **38.** A method as recited in claim 36 wherein the aspect ratio associated
14 with the enhancement layer corresponds to an aspect ratio associated with high-
15 resolution televisions.

16
17 **39.** A method as recited in claim 36 wherein the base layer is
18 transmitted using a first transmission medium and the enhancement layer is
19 transmitted using a second transmission medium.

20
21 **40.** A method as recited in claim 36 wherein the base layer is
22 transmitted using a first transmission format and the enhancement layer is
23 transmitted using a second transmission format.

1 **41.** One or more computer-readable memories containing a computer
2 program that is executable by a processor to perform the method recited in claim
3 36.

4
5 **42.** An apparatus comprising:
6 a base layer generator to generate a base layer having a first aspect ratio,
7 wherein the base layer represents a low-resolution portion of an image; and
8 an enhancement layer generator coupled to the base layer generator to
9 generate an enhancement layer having a second aspect ratio, wherein the
10 enhancement layer represents a high-resolution portion of the image, and wherein
11 the first aspect ratio differs from the second aspect ratio.

12
13 **43.** An apparatus as recited in claim 42 wherein the base layer generator
14 is a low-pass filter.

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16 **44.** An apparatus as recited in claim 42 wherein the enhancement layer
17 generator is a high-pass filter.

18
19 **45.** An apparatus as recited in claim 42 wherein the enhancement layer
20 generator includes an image extractor to extract a portion of the base layer and a
21 differencing module to subtract the extracted portion of the base layer from a
22 corresponding portion of the image.

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2 **46.** An apparatus as recited in claim 42 further including a transmitter
3 coupled to the base layer generator and the enhancement layer generator, wherein
4 the transmitter combines the base layer and the enhancement layer into a single
5 transport stream.

6
7 **47.** An apparatus as recited in claim 42 further including a transmitter
8 coupled to the base layer generator and the enhancement layer generator, wherein
9 the transmitter transmits the base layer and the enhancement layer to an image
10 decoding system.

11
12 **48.** An apparatus as recited in claim 42 further including a transmitter
13 coupled to the base layer generator, wherein the transmitter that transmits only the
14 base layer to an image decoding system.

15
16 **49.** An apparatus as recited in claim 42 further including a storage
17 medium coupled to the base layer generator and the enhancement layer generator,
18 wherein the storage medium stores the base layer and the enhancement layer.

19
20 **50.** An apparatus comprising:
21 a base layer decoder to decode a base layer representing a low-resolution
22 portion of an image, wherein the base layer has an associated aspect ratio; and
23 an enhancement layer decoder coupled to the base layer decoder to decode
24 an enhancement layer representing a high-resolution portion of an image, wherein
25

1 the enhancement layer has an associated aspect ratio that differs from the aspect
2 ratio associated with the base layer.

3
4 **51.** An apparatus as recited in claim 50 wherein the aspect ratio
5 associated with the base layer corresponds to an aspect ratio associated with low-
6 resolution televisions.

7
8 **52.** An apparatus as recited in claim 50 wherein the aspect ratio
9 associated with the enhancement layer corresponds to an aspect ratio associated
10 with high-resolution televisions.

11
12 **53.** An apparatus as recited in claim 50 wherein the apparatus is a
13 television.

14
15 **54.** An apparatus as recited in claim 50 further including a receiver
16 coupled to the base layer decoder and the enhancement layer decoder, wherein the
17 receiver is to receive a transport stream containing a base layer and an
18 enhancement layer.

19
20 **55.** One or more computer-readable media having stored thereon a
21 computer program comprising the following steps:

22 generating a first layer representing a low-resolution portion of a source
23 image, wherein the first layer has an associated aspect ratio; and

24 generating a second layer representing a high-resolution portion of the
25 source image, wherein the second layer has an associated aspect ratio, and wherein

1 the aspect ratio associated with the second layer is different from the aspect ratio
2 associated with the first layer.

3
4 **56.** One or more computer-readable media as recited in claim 55
5 wherein the aspect ratio associated with the first layer is 4:3.

6
7 **57.** One or more computer-readable media as recited in claim 55
8 wherein the aspect ratio associated with the second layer is 16:9.

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10 **58.** One or more computer-readable media as recited in claim 55
11 wherein the first layer is a base layer.

12
13 **59.** One or more computer-readable media as recited in claim 55
14 wherein the second layer is an enhancement layer.

15
16 **60.** One or more computer-readable media as recited in claim 55
17 wherein the step of generating a second layer includes comparing a portion of the
18 first layer with a corresponding portion of the source image.

19
20 **61.** One or more computer-readable media as recited in claim 55 further
21 including transmitting the first layer and the second layer to an image decoding
22 system.

1 **62.** One or more computer-readable media as recited in claim 55 further
2 including transmitting only the first layer to an image decoding system.

3
4 **63.** One or more computer-readable media as recited in claim 55 further
5 including storing the first layer on a storage medium.

6
7 **64.** One or more computer-readable media as recited in claim 55 further
8 including storing the second layer on a storage medium.

9
10 **65.** One or more computer-readable media having stored thereon a
11 computer program comprising the following steps:

12 decoding a base layer representing a low-resolution portion of an encoded
13 image, wherein the base layer has a first aspect ratio; and

14 decoding an enhancement layer representing a high-resolution portion of
15 the encoded image, wherein the enhancement layer has a second aspect ratio, and
16 wherein the first aspect ratio is different from the second aspect ratio.

17
18 **66.** One or more computer-readable media as recited in claim 65
19 wherein the first aspect ratio is 4:3.

20
21 **67.** One or more computer-readable media as recited in claim 65
22 wherein the second aspect ratio is 16:9.

1 **68.** One or more computer-readable media as recited in claim 65 further
2 including communicating the base layer to a low-resolution television.

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4 **69.** One or more computer-readable media as recited in claim 65 further
5 including communicating the base layer and the enhancement layer to a high-
6 resolution television.

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